

Missouri Department of Transportation

SPECIFICATIONS**FOR****UHF HAND-HELD RADIO UNITS**

THE BIDDER HEREBY AGREES TO FURNISH ITEMS AND SERVICES, AT THE PRICES QUOTED, PURSUANT TO ALL REQUIREMENTS AND SPECIFICATIONS CONTAINED IN THIS DOCUMENT, UPON RECEIPT OF AN AUTHORIZED PURCHASE ORDER FROM THE DIVISION OF GENERAL SERVICES. THE BIDDER FURTHER AGREES THAT THE LANGUAGE OF THIS DOCUMENT SHALL GOVERN IN THE EVENT OF A CONFLICT WITH HIS OR HER BID.

| | | |
|----------------------|--------------|-------|
| AUTHORIZED SIGNATURE | PRINTED NAME | TITLE |
| COMPANY | | DATE |
| MAILING ADDRESS | | PHONE |
| CITY | STATE | ZIP |

Authorized Signature: _____ Date: _____

GENERAL

The Missouri Department of Transportation (hereinafter referred to as the Department) desires to establish a contract for the purchase of two-channel hand held radios operating in the UHF frequency band with an RF output power of two (2) watts. These radios shall be built to provide the utmost reliability and durability while operating in an outdoor environment. The units purchased shall be compatible with and work into the Department's statewide two-way radio system and be FCC type accepted. The units shall transmit and receive on the UHF frequencies assigned herein. Continuous "sub audible" tones, as assigned, shall operate with the transmit and receive frequencies.

APPROVED PRODUCTS

Award will only be made on products on the latest revision of the MoDOT Approved Products List for Two Way Radio Equipment.

CONTRACTUAL REQUIREMENTS**CONTRACT PERIOD**

The original contract period shall be for one year. The contract shall not bind, nor purport to bind, the Department for any contractual commitment in excess of the original contract period.

CONTRACT PRICE

All prices shall be firm and fixed. The Department shall not pay nor be liable for any other additional costs including but not limited to taxes, shipping charges, insurance, interest, penalties, termination payments, attorney fees, liquidated damages, etc. The contractor shall not invoice federal excise tax unless otherwise required under federal law or regulation.

SUBCONTRACTORS

If approved by the Department in writing, the contractor may subcontract for those services describe herein provided that any subcontracts include appropriate provisions and contractual obligations to ensure the successful fulfillment of all contractual obligations agreed to by the contractor and the Department and to ensure that the Department is indemnified, saved, and held harmless from and against any and all claims of damage, loss, and cost (including attorney fees) of any kind related to a subcontract in those matters described in the contract between the Department and the contractor. The contractor shall expressly understand and agree that he shall assume and be solely responsible for all legal and financial responsibilities related to the execution of a subcontract. The contractor shall agree and understand that utilization of a sub-contractor to provide any of the equipment or services in the contract shall in no way relieve the contractor of the responsibility for providing the equipment or services as described and set forth herein.

INSURANCE

The contractor shall understand and agree that the Department cannot save and hold harmless and/or indemnify the contractor or employees against any liability incurred or arising as a result of any activity of the contractor or any activity of the contractor's employees related to the contractor's performance under the contract.

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CONTRACT EXTENSIONS

The Department shall have the right, at its sole option, to extend the contract for up to two (2) additional one-year periods, or a portion thereof. In the event that the Department exercises its options, all terms, conditions, and provisions of the original contract shall remain the same and apply during the extension period. If the options are exercised, the contractor shall agree that the prices stated in the original contract shall not be increased in excess of the maximum percentage of increases, if any, stated on the pricing page of the contract. Any percentages of increase shall be computed against the original contract price for each extension period. If the pricing page does not include such percentages or if applicable spaces are left blank, or not completed, prices during extension periods shall be the same as during the original contract period. The Department does not automatically exercise its options based upon the maximum percentage of increase without documented justification supporting an increase and reserves the right to offer or to request an extension of the contract at a price less than that price derived from the Contractor's extension percentages, if any.

DELIVERY

Units shall be delivered within 30 calendar days from the date on the purchase order(s) to the Department's office(s) as specified on the purchase order. A list of delivery locations is attached as Appendix A. Charges for delivery shall be included in the bid price.

Each radio shall be delivered to the location fully assembled. This assembly cost shall be included in the bid price.

LIQUIDATED DAMAGES

Delivery Damages shall be set at twenty five (25) dollars per radio unit per day for each day beyond the thirty (30) calendar day delivery period. Damages shall be assessed in the event that some or all of the components making up a radio unit are not received by the specified delivery date.

In the event that any component of a radio unit received does not comply with the specifications as outlined above, the supplier shall make all corrections necessary to bring the unit into compliance. Any costs resulting from this necessary repair/replacement shall be borne by the supplier and shall be performed within fourteen (14) calendar days of its being reported to the supplier unless otherwise agreed to by the department's representative. Acceptance Damages of twenty five (25) dollars per radio unit per day shall be assessed for each unit not in compliance after the fourteen (14) calendar days or the agreed upon deadline. A radio unit is as defined above.

Damages will be limited to fifty (50) percent of the total contract price. When this amount is reached the Commission, at its discretion, reserves the right to cancel the remainder of the contract without being considered in breach of the contract and without any additional payment to the supplier. Prior to the effective date of cancellation by the Commission, the Commission will purchase all units requested, received and found acceptable, less any liquidated damages per location. The Commission will apply liquidated damages per location not fulfilled.

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AWARD

Award will be all or none. However, the right is reserved to reject any and all bids or award the bid based on the best interest of the Department. Award of this bid does not constitute final acceptance.

PAYMENT

The Department is willing to make one partial payment per group per delivery point on the equipment received up to fifty (50) percent of the total equipment price for that delivery point prior to final acceptance if, in the opinion of the engineer, the equipment is considered reasonably in conformance with the specifications.

Invoices, per group, per delivery point, in triplicate per payment request per purchase order, should reflect the identical item as listed on the purchase order. These invoices shall include the purchase order number, date of shipment, and a unique serial number for each item.

Final payment for all units will be made in the same manner only after all units have been delivered and found acceptable.

CONTRACTOR REQUIREMENTS**GENERAL REQUIREMENTS**

The contractor shall provide radio units for the Department in accordance with the terms and conditions stated herein.

All equipment and services shall be provided to the sole satisfaction of the Department.

Unless stated differently, the contractor shall provide all equipment and personnel needed to fulfill the terms of the contract.

TECHNICAL SPECIFICATIONS**GENERAL SPECIFICATIONS**

Each radio shall be a handheld UHF radio with two (2) watts of RF a output power, a minimum of eight (8) channels, a replaceable antenna, and provided with two (2) batteries, belt clip, carrying case and a lapel speaker/microphone.

ANTENNA

The antenna shall be a durable flexible antenna. No "stubby" or compact antennas will be allowed.

BATTERY

Each radio shall be furnished with two (2) rechargeable Nickel Cadmium, Lithium Ion, or Nickel Metal Hydride battery packs with a guaranteed minimum 5-5-90 duty cycle at two (2) watts for ten (10) hours. Use of battery savers that disable the receiver shall not be allowed.

RECHARGER

One compatible recharger, operating on 120 volt, A.C., 60 Hertz power, shall be provided for each radio. Each unit shall be capable of fully charging one radio and/or battery pack.

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The recharger shall be a "smart charger." The recharger shall have an indicator light to show that the battery is recharging and shall control charging so as not to cause damage to the batteries. The recharger shall have automatic shutoff control, with an indicator light to denote a full charge. The battery pack shall be fully recharged in a period of less than 10 hours.

PROGRAMMING CAPABILITIES

The supplier shall program all radios. All radios shall be programmable from a personal computer and shall be able to transfer or clone its information to or from another like unit using a connecting cable between radios. Each radio shall be programmed as indicated on Appendix B unless otherwise indicated on the purchase order. The unit shall be configured so that if the unit is turned to a channel that is not programmed, a tone will sound notifying the operator. In addition, the unit will not be operational on the additional channels.

MEMORY BACKUP

The radio shall have one of the following:

1. An internal lithium battery to maintain all programming. The battery shall have a minimum life of 5 years.
2. A non-volatile memory that retains all programming and status without a battery.

ENVIRONMENTAL SPECIFICATIONS

Independent laboratory certification on the following environmental specifications shall be required:

MIL-STD 810D

Low Pressure
High Pressure
Low Temperature
Temperature Shock
Solar Radiation
Rain
Humidity
Dust
Vibration
Shock

Methods/Procedures

Method 500.2 Procedure 1
Method 501.2 Procedure 1 & 2
Method 502.2 Procedure 2
Method 503.2 Procedure 1
Method 505.2 Procedure 1
Method 506.2 Procedure 2
Method 507.2 Procedure 2
Method 510.2 Procedure 1
Method 514.3 Procedure 1
Method 516.3 Procedure 1 & 4

PERFORMANCE SPECIFICATIONS

General

| | |
|---|------------------|
| Frequency Range | 450 to 470 MHz |
| Number of Channels | 8 |
| Channel Spacing | 25 KHz, 12.5 KHz |
| PLL Step | 5, 6.25 KHz |
| Battery Life (5-5-90 duty cycle with battery saver off) | 10 Hours |

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| | |
|-----------------------------|-------------------------------------|
| Operating Temperature Range | -22° F to +140° F (-30° C to +60°C) |
| Antenna Impedence | 50 Ohms |

Transmitter

| | |
|-------------------------|--|
| RF Power Output | 2 Watts |
| Frequency Stability: | $\pm 0.0005\%$ at 2 watts (-30°C to +60°C) |
| Spurious and Harmonics: | -60dB |
| FM Noise: | -45dB |
| Audio Response: | +1dB, -3dB from 300Hz to 2800Hz |
| Audio Distortion: | 5% or less at 1000Hz (at 60% deviation) |
| Frequency Separation: | 10MHz |

Receiver

| | |
|---------------------------|---------------------------------|
| Frequency Stability: | $\pm 0.0005\%$ (-30°C to +60°C) |
| Modulation Acceptance: | ± 7 KHz |
| Sensitivity (12dB SINAD): | 0.35uV |
| Selectivity (EIA SINAD): | -65dB |
| Squelch Sensitivity: | 0.28 uV |
| Image Rejection: | -65dB |
| Spurious Rejection: | -65dB |
| Inter modulation: | -65dB |
| Audio Output: | 500mW at 5% or less distortion |

CONTROLS

The following controls shall be provided.

1. Volume control
2. On-off control (can be integrated into the volume control)
3. Channel control
4. A "Transmit" indicator

CTCSS CIRCUITRY

All receivers and transmitters shall be equipped with continuous tone coded squelch system (CTCSS) capability programmable by channel. Tones must be continuously transmitted with the carrier frequency. The CTCSS capability shall be equipped with reverse burst signaling to eliminate squelch tail.

PROVIDED ACCESSORIES

The following accessories shall be included in the bid price of each radio unit.

1. A spring loaded belt clip
2. A durable carrying case (leather or urethane) and a D-clip type belt attachment
3. An external speaker/microphone that can be attached to a lapel

FCC COMPLIANCE

All radios shall by type accepted for use with 47 CFR Part 90.

MANUALS AND DOCUMENTATION

Authorized Signature: _____ Date: _____

OPERATING MANUAL

One operating manual shall be delivered with each radio. At a minimum, the manuals shall include information on installation, setup, configuration and programming (if applicable), operating guidelines, safety, and connections. The cost of the operating manuals shall be included in the bid price.

SERVICE MANUAL

Twelve (12) service manuals showing all circuits, part numbers, part installations, operating voltage, theory of operation, programming, and maintenance procedures shall be furnished at no additional charge. One (1) service manual shall be furnished to each District and two (2) service manuals shall be provided for General Headquarters Traffic.

Service bulletins shall also be provided, at no additional charge, to each delivery location and to General Headquarters Traffic for a minimum of seven (7) years from the date of the purchase order. The service bulletin shall show all updates pertaining to maintenance of the units.

PROGRAMMING AND SOFTWARE

Twelve (12) sets of programming software (compatible with the following Operating Systems: Windows 98/NT/2000/XP) and licenses, for Department furnished computers, and connecting cables need for programming shall be provided at no additional charge. One (1) programming software set shall be furnished to each District and two (2) programming software sets shall be provided for General Headquarters Traffic. The Department shall receive all software updates for a minimum of five (5) years from the date of purchase order at no charge to the Department.

The bidder shall include the following in the bid price:

1. Twelve (12) sets of programming software and licenses. The bidder shall include a programming manual with each software package.
2. Twelve (12) connecting cables and all necessary equipment used in the cloning process.
3. Twelve (12) connecting cables used between the radio and a computer along with twelve (12) individual software package rights for department furnished computers. The programming cable shall be fully equipped to connect to a standard 9-pin male D-sub serial connector on the computer.

OPTIONAL EQUIPMENT

The following optional equipment must be available for purchase at the Department's discretion:

1. Tester, if required for troubleshooting or bench work the bidder shall include as a separate bid item the cost of such testers. The bidder shall also provide technical data sheets for the tester
2. Replacement battery identical to battery provided with radio.
3. Replacement antenna identical to the antenna provided with the radio.
4. Replacement carrying case identical to the carrying case provided with the radio.
5. Replacement lapel speaker/microphone identical to the lapel speaker/microphone provided with radio.

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6. Voice-activated (with push-to-talk option) microphone/headset combination compatible with the unit offered.

These optional bid items will not be considered as part of the bid, but are required to be available. A firm quote should be given for each item, should the Commission deem it necessary to purchase such accessories as identified on the purchase order.

OTHER OPTIONAL EQUIPMENT AND ACCESSORIES

The Department shall have the option to purchase additional accessories at the percent discount off of Manufacture's List Price as indicated on the Pricing Page.

SERVICE AND SUPPORT

SERVICE

The bidder shall supply location, contact and shipping information for the authorized company or associated service shop where warranty work can be accomplished.

The successful bidder shall also provide contact information (name, address, phone, e-mail) for technical support representative(s). The representative(s) shall be available during normal weekday hours by phone and e-mail to assist with setup, programming, operation and other technical aspects of the equipment. All costs for technical support shall be included in the bid price.

WARRANTY

All parts and materials shall be guaranteed to be free from defects or defective workmanship for a minimum of one (1) year from the date of installation or initial operation as recorded by Department staff. For the guarantee limits, it will be considered that all units will be placed in service within twelve (12) months after receipt.

TECHNICAL ORIENTATION

The successful bidder shall present a complete course of instruction to the Department's radio maintenance personnel. The course shall cover programming, operation, troubleshooting, and maintenance of the radio. This course will be held in Jefferson City or other Missouri city at a time mutually agreeable by the bidder and the Department. The bidder shall provide all equipment and instruction materials necessary for the course. This course shall be at no cost to the Department.

~ End of Specification ~

Authorized Signature: _____ Date: _____

PRICING PAGE

In the Event that the Department exercises its options to renew the contract for two (2) additional one-year periods pursuant to the applicable provisions outlined in this document, the Contractor shall provide below the maximum percentage of increase or minimum percentages of decrease for each renewal period. The Contractor is cautioned that the percentages shall be computed against the ORIGINAL contract prices during renewal periods shall be the same as during the original contract period. Furthermore, the Contractor is advised that the Department does not automatically grant increases at the time of renewing the contract and that if an increase is requested, documentation of need must be provided at the time of renewal.

First Renewal Period _____ **% of maximum increase and/or**
 _____ **% of maximum decrease**

Second Renewal Period _____ **% of maximum increase and/or**
 _____ **% of maximum decrease**

In the Event that the Department exercises its option to purchase additional accessories (with the exception of those required above under "OPTIONAL EQUIPMENT") all accessories will be offered to the Department.

_____ **% Discount off of the Manufacturer's Current List Price.**

This discount is not affected by the increase/decrease associated with the renewal of the contract.

 Signature of Contractor's Authorized Representative

 Date Signed

Authorized Signature: _____ Date: _____

APPENDIX A

Potential Delivery Locations

District 1
St. Joseph, MO

District 2
Macon, MO

District 3
Hannibal, MO

District 4
Lee's Summit, MO

District 5
Jefferson City, MO

District 6
Chesterfield, MO

District 7
Joplin, MO

District 8
Springfield, MO

District 9
Willow Springs, MO

District 10
Sikeston, MO

MoDOT General Headquarters
Jefferson City, MO

Authorized Signature: _____ Date: _____

*APPENDIX B**Channel Listing*

| Ch No. | Receive Frequency (MHz) | Transmit Frequency (MHz) | CTCSS Decode Tone | CTCSS Encode Tone | Narrow/Wide Band | Power Output (Watts)* |
|---------------|--|---|----------------------------------|----------------------------------|-----------------------------|--------------------------------------|
| 1 | 453.1625 | 453.1625 | NONE | NONE | N | 2 |
| 2 | 453.2625 | 453.2625 | NONE | NONE | N | 2 |
| 3 | 453.1625 | 453.1625 | 114.8 | 114.8 | N | 2 |
| 4 | 453.2625 | 453.2625 | 114.8 | 114.8 | N | 2 |
| 5 | 453.1625 | 453.1625 | 127.3 | 127.3 | N | 2 |
| 6 | 453.2625 | 453.2625 | 127.3 | 127.3 | N | 2 |
| 7 | 453.1625 | 453.1625 | 141.3 | 141.3 | N | 2 |
| 8 | 453.2625 | 453.2625 | 141.3 | 141.3 | N | 2 |

* The MoDOT FCC license is limited to a maximum of 2 watts on these channels.

Authorized Signature: _____ Date: _____